

Remarks

The Office Action dated June 13, 2007 has been received and reviewed. Claims 1-74 are pending in this application. Claims 1-4, 6, 8-26, 28 and 30-45 stand rejected. Claims 1, 2, 22, 23, and 40 have been amended. Independent claims 1, 2, 22, and 23 have been amended to recite "an ethylenically unsaturated polymerizable component." This amendment is supported by the specification at, for example, page 12, lines 5-7. Independent claims 1 and 22 have been amended to recite that "R¹ is an organic moiety includes an ethylenically unsaturated polymerizable group." This amendment is supported by the specification at, for example, page 10, lines 7-26, and at, for example, page 8, lines 15-16. Claim 40 has been amended to depend from claim 23. Claims 13 and 39 have been canceled. Claims 5, 7, 27, 29 and 46-74 are withdrawn from consideration as being drawn to non-elected species or invention. Withdrawn claims 46, 47, 50, 51, 62, and 63 have been amended.

Rejection under 35 U.S.C. § 112

Claims 1-4, 6, 8-12, 15-26, 28, 30-38 and 41-45 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Applicants respectfully traverse this rejection. Independent claims 1, 2, 22, and 23 recite "an ethylenically unsaturated polymerizable component" and are supported by the specification at, for example, page 12, lines 5-7. Independent claims 1 and 22 recite that R¹ "is an organic moiety that includes an ethylenically unsaturated polymerizable group" and are supported by the specification at, for example, page 8, lines 15-16 and page 10, lines 24-26. Claims 3-4, 8-12, and 15-21 depend from or ultimately depend from independent claim 2. Claims 24-26, 28, 30-38, and 41-45 depend from or ultimately depend from independent claim 23. Thus, claims 1-4, 6, 8-12, 15-26, 28, 30-38 and 41-45 reasonably convey to one skilled in the art that Applicants, at the time the application was filed, had possession of the claimed invention. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 112, first paragraph, is requested.

Rejection under 35 U.S.C. § 102(b)

Claims 1-4, 6, 8-26, 28 and 30-45 stand rejected under 35 USC 102(b) as being anticipated by Haberland et al. (DD 273846). Applicants respectfully traverse this rejection. Haberland et al. teach a phosphorus-containing adhesion promoter for

increasing bonding strength in bonds with methacrylate adhesive or coatings. Page 2, first paragraph. The adhesion promoter is taught to be a bisphosphonic acid comprising an N-acroyl-amino group. Claim 1, Formula. Haberland et al. specifically teach an adhesion promoter containing the bisphosphonic acid “in an aqueous solution.” Cover page, (57). Haberland et al. further teach an adhesion promoter for methacrylate bonds with hard, human tissue comprising an N-acroyl-amino bisphosphonic acid “in an aqueous solution.” Cover page, (57). Haberland et al. teach the preparation of an aqueous primer solution, and teach the concentration of the N-acroyl-amino bisphosphonic acid in the aqueous primer solution to be 1 weight percent. Example 2.

Independent claims 1, 2, 22, and 23 are not anticipated by Haberland et al. In Example 2, Haberland et al. teach preparing a cattle tooth by treating (etching) the tooth for 30 seconds with “37% orthophosphoric acid solution.” The 1 weight percent aqueous N-acroyl-amino bisphosphonic acid primer solution is then applied to the tooth. Haberland et al. do not teach that the 1 weight percent aqueous N-acroyl-amino bisphosphonic acid primer solution comprises an ethylenically unsaturated polymerizable component as required by independent claims 1, 2, 22, and 23.

Further, in Example 3, Haberland et al. teach a curable composition comprising the N-acroyl-amino bisphosphonic acid. In Example 3, the composition is prepared by combining the 1 weight percent aqueous solution of Example 2 with hydroxyapatite “or similar filler” at a weight ratio of 100 parts by weight of the filler with 200 parts by weight of the 1 weight percent aqueous solution of Example 2. When the mixture is dried, as taught in Example 3, the resultant mixture of filler and N-acroyl-amino bisphosphonic acid is easily calculated to contain less than 2 weight percent of the N-acroyl-amino bisphosphonic acid. The curable composition is taught by Haberland et al. to contain 27.9 parts by weight of the filler/bisphosphonic acid mixture (which, as noted above, contains less than 2 weight percent of the N-acroyl-amino bisphosphonic acid). Thus, the curable composition of Haberland et al. contains less than 0.56 weight percent of the N-acroyl-amino bisphosphonic acid. In Example 3, Haberland et al. teach a tooth prepared as in Example 2 (i.e., treated (etched) with 37% orthophosphoric acid solution). By preparing the tooth by treating (etching) it with 37% orthophosphoric acid solution, Haberland et al. do not teach that the curable composition comprising the N-acroyl-amino bisphosphonic acid contains an amount of the bisphosphonic acid sufficient to etch a hard surface, thereby forming an etchant, as

required by independent claims 1 and 2. For at least this reason, independent claims 1 and 2 are not anticipated by Haberland et al. As noted above, the curable composition of Haberland et al. contains less than 0.56 weight percent of the N-acroyl-amino bisphosphonic acid, which less than the about 1 weight percent required by independent claims 22 and 23. For at least this reason, independent claims 22 and 23 are not anticipated by Haberland et al. Claims 3, 4, 6, 8-21, 24-26, 28 and 30-45 depend from independent claims that are not anticipated by Haberland et al. and therefore are not anticipated by Haberland et al. Reconsideration and withdrawal of the rejection is requested.

Rejection under 35 U.S.C. § 103(a)

Claims 1-4, 6, 8-26, 28 and 30-45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Omura et al. (US 4,499,251). Applicants respectfully traverse this rejection. Omura et al. teach an adhesive composition comprising a compound of Formula (I). Column 4, lines 20-58. Formula (I) may comprise phosphonic acid or phosphoric acid ester groups, and Omura et al. teach that, in the general structures in columns 5 and 6, these groups are “represented by $[\text{PO}_3\text{H}_2]$.” Column 5, lines 57-59. The Examiner points to, for example, the third structure in column 6, but Applicants note that, based on the above-cited teachings of Omura et al., it is not possible to know to which type of group (phosphonic acid or phosphoric acid ester) Omura et al. are referring in this structure. Furthermore, the group designated “A₂” by Omura et al. does not provide information regarding the atom or atoms to which the acid or ester groups are bonded. Thus, it is not possible to determine, based on this structure or any of the first four structures in column 6, that the groups are phosphonic acid groups that are bonded to the same carbon atom, as required by independent claims 1, 2, 22, and 23. There is no teaching or suggestion, in the reference or elsewhere that would lead one to the claimed compositions based on the general structures of Omura et al. For at least this reason, independent claims 1, 2, 22, and 23 are patentable over Omura et al. Claims 3, 4, 6, 8-21, 24-26, 28 and 30-45 depend from independent claims that are patentable over Omura et al. and are therefore patentable over Omura et al.

Further, Omura et al. teach specific compounds, identified by structure, in, for example, columns 7-14. Applicants note that most of these compounds are phosphoric acid esters, not phosphonic acids as required by independent claims 1, 2, 22, and 23.

The compounds that are represented as phosphonic acids (for example, column 8, first and sixth structures; column 11, seventh structure; column 13, first structures; column 22, last structure) each comprise a group (referred to by Omura et al. in Formula (I) as R_4 or R_a) that is substituted with heteroatoms such as oxygen and nitrogen (in addition to those heteroatoms in the polymerizable (meth)acrylate or (meth)acrylamide group(s)). Independent claims 1 and 22 are patentable over Omura et al. at least because claims 1 and 22 require that R^1 is an organic moiety, defined in the specification at page 10, lines 7-26 to be an unsubstituted (i.e., without O, N, Si, P, or S atoms) organic moiety, that includes an ethylenically unsaturated polymerizable group (which can include heteroatoms such as, for example, oxygen and/or nitrogen). Independent claims 2 and 23 are patentable over Omura et al. at least because claims 2 and 23 require that A is a straight chain or branched organic moiety that includes an ethylenically unsaturated polymerizable group. There is no teaching or suggestion, in the reference or elsewhere that would lead one to the claimed compositions based on the specific structures of Omura et al. For at least this reason, independent claims 1, 2, 22, and 23 are patentable over Omura et al. Claims 3, 4, 6, 8-21, 24-26, 28 and 30-45 depend from independent claims that are patentable over Omura et al. and are therefore patentable over Omura et al.

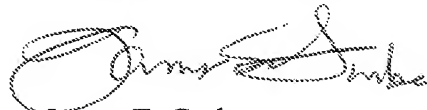
Omura et al. teach the preparation of a phosphonic acid in Production Example 3. The reaction product, Compound (D), comprises oxygen atoms, in addition to those in the polymerizable group, in the group that corresponds to R_4 or R_a . The compounds used by Omura et al. to prepare Compound (D) necessarily results in a product having a group corresponding to R_4 or R_a that is substituted with heteroatoms. Omura et al. do not teach, suggest, or enable any other method to prepare phosphonic acids, including phosphonic acids wherein the group that corresponds to R_4 or R_a is unsubstituted (i.e., is an organic moiety as defined by the instant specification at page 10, lines 7-26) and wherein the acid groups are phosphonic acid groups that are bonded to the same carbon atom, as required by independent claims 1, 2, 22, and 23. For at least this reason, independent claims 1, 2, 22, and 23 are patentable over Omura et al. Claims 3, 4, 6, 8-21, 24-26, 28 and 30-45 depend from independent claims that are patentable over Omura et al. and are therefore patentable over Omura et al. Reconsideration and withdrawal of the rejection is requested.

Request for Rejoinder

Pending claims 5, 7, 27, and 29 have been withdrawn from consideration as not reading on the elected species, an identification that may have been made in error. Claims 5 and 7 depend from independent claim 2, and claims 27 and 29 depend from independent claim 23. Upon indication of either claim 2 or claim 23 being allowable, Applicants respectfully request the restriction/election requirement be reconsidered, and that claims 5, 7, 27, and 29 be rejoined, examined, and passed on to allowance pursuant to M.P.E.P. § 821.04.

All outstanding objections and rejections are believed to have been met and overcome. If a telephonic conference with Applicants' undersigned representative would be useful in advancing the prosecution of the present application, the Examiner is invited to contact the undersigned at (651) 736-7224. A notice of allowance for all pending claims is respectfully solicited.

Respectfully submitted,



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